CLAIMS

WHAT IS CLAIMED IS:

1. A method of forming polyolefins, comprising:
providing a catalyst slurry comprising a metallocene catalyst and a first oil;
providing a transport medium comprising a second oil;
combining the transport medium and the catalyst slurry to form a catalyst mixture;
introducing the catalyst mixture to a polymerization reactor; and
contacting olefin monomers with the catalyst mixture to polymerize the olefin monomers and form polyolefins.

2. The method of claim 1, wherein providing the catalyst slurry includes mixing the catalyst slurry in a first vessel to maintain the metallocene catalyst suspended in the first oil.

3. The method of claim 1, wherein providing the catalyst slurry includes mixing the catalyst slurry in a first vessel, the first vessel including a catalyst slurry inlet, a catalyst slurry outlet and a housing having an upper portion and a lower portion, the lower portion disposed proximate the catalyst slurry outlet and having a proximal end nearest the catalyst slurry inlet and a distal end nearest the catalyst slurry outlet, the proximal end having a circumference that is greater than the circumference of the distal end.

4. The method of claim 1, wherein providing the catalyst slurry includes passing the catalyst slurry from a first vessel to a second vessel prior to combining the transport medium and the catalyst slurry, the second vessel having a substantially conical portion and a volume that is smaller than the volume of the first vessel, the

method further comprising passing the catalyst mixture through at least one meter configured to measure a catalyst addition rate.

5. The method of claim 1, wherein providing the catalyst slurry includes monitoring a catalyst addition rate, the monitoring a catalyst addition rate including disposing the catalyst slurry in a second vessel having a catalyst slurry inlet and a catalyst slurry outlet and measuring the level of catalyst slurry within the second vessel.

6. The method of claim 1, wherein the metallocene catalyst comprises 25 wt % or less of the catalyst slurry mixture.

7. The method of claim 1, wherein the catalyst has an activity of 3500 gPP/(gCat*hr) or more.

8. The method of claim 1, wherein the first oil and the second oil comprise mineral oil.

9. The method of claim 1, wherein the first oil and the second oil each have a kinematic viscosity of from 0.63 centistokes to 200 centistokes at 40 °C.

10. The method of claim 1, wherein the catalyst is a supported metallocene catalyst.

11. The method of claim 1, wherein the second oil comprises 10 wt % or more of the catalyst mixture.

12. The method of claim 1, wherein the catalyst slurry comprises from 25 wt % to 5 wt % metallocene catalyst and from 75 wt % to 95 wt % first oil.

13. The method of claim 1, wherein the transport medium comprises 85 wt % or more second oil.

14. The method of claim 1, wherein the transport medium comprises 95 wt % or more second oil.

15. The method of claim 1, wherein the catalyst mixture comprises from 20 wt % to 80 wt % catalyst slurry and from 80 wt % to 20 wt % transport medium.

16. The method of claim 1, wherein combining the transport medium and the catalyst slurry to form a catalyst mixture provides a catalyst mixture with a lower viscosity than the viscosity of the catalyst slurry.

17. The method of claim 1, wherein the olefin monomers comprise propylene.

18. A method of forming polypropylene, comprising:
providing a catalyst slurry consisting essentially of a metallocene catalyst and a first mineral oil having a kinematic viscosity of from about 0.63 centistokes to 200 centistokes at 40 °C;
providing a transport medium consisting essentially of a second mineral oil;
combining the transport medium and the catalyst slurry to form a catalyst mixture;
introducing the catalyst mixture to a polymerization reactor; and
contacting propylene monomers with the catalyst mixture to polymerize the propylene monomers and form polypropylene.

19. The method of claim 1 or 18, wherein the catalyst mixture comprises from 10 wt % to 90 wt % catalyst slurry and from 90 wt % to 10 wt % transport medium.

20. The method of claim 18, wherein the catalyst mixture comprises from 20 wt % to 80 wt % catalyst slurry and from 80 wt % to 20 wt % transport medium.